The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers, Limited

VOL. XLV. No. 1157 — August 30, 1941 — Annual Subscription, 21s. Overseas, 26s.

The Chemist as a Linkage

THE diversity between one element and another can be paralleled by the diversity between the research chemist and the product salesman. Valency linkages are necessary to join one element to another in order to form a useful compound in which the two elements function as a harmonious whole. Similarly, there must be a link between the research laboratory and the sales staff.

The Americans, like the Greeks of old, have a word for it. They call this link "the Application Research Chemist." It is an idea that might well be adopted in this country, and opens a new field for the utilisation of the chemist. The research chemist proper is concerned primarily with the more abstract part of the firm's business. It is he who has to take a long view and prepare for commercial needs some years ahead. He is concerned with purely laboratory technique and very often there is a difficulty in making him commercially minded. The head of a research laboratory should always be commercially minded, but it by no means follows that he and the sales staff can understand each other's point of view. The sales staff may or may not have any chemical knowledge. Many product salesmen are purely salesmen. They know the names of the chemicals they have to sell and they know to what uses they can be put; and perhaps in a general way what their reactions are, at least during transportation and handling. They have their finger upon the chemical market and are able to forecast with considerable accuracy what are likely to be the price trends. Their knowledge is specialised and valuable, for without it the products of chemical manufacture could not fetch their proper market value.

It frequently happens that the sales department finds the need for new products or processes, for new uses for their products, or for improvements in the quality of their products. Sometimes those who demand these things are crying for the moon; sometimes they are required only to satisfy the whim of one or two customers; at other times the sales department strikes a good idea worthy of investigation, but which the research department does not feel called upon to take an interest in. The linkage between these two points of view is the "application research chemist" whose work it is to act as a bond between the two and to work directly on the problems experienced by the sales staff.

It is evident that an application research chemist must have just as thorough a chemical training as any other chemist. He must also have a thorough working knowledge of his own processes and products and of the processes in which his firm's products are to be used by the purchasers. His industrial knowledge must be wide in order to enable him to suggest new uses, and he must have a good knowledge of competitive products or processes. Above all his outlook must be practical, and he must think, not in terms of laboratory technique, but always in terms of commercial-scale developments.

His would be the duty of following up the visits of the sales staff where necessary in order to smooth out technical difficulties that may have arisen owing to complaints as to quality or difficulties in working processes. The fuel industries, for example, have found that in addition to coke and gas salesmen they must have technical experts to instruct consumers in the best methods of using these products and to adapt existing fuels to new uses for which they have not hitherto been employed. Eactly the same procedure can be adopted with chemical products of all kinds. In addition to this "outside" work, the application research chemist has important duties in defining the projects to be investigated. He may at times succeed in doing all this by himself, or he may require the assistance of the regular research department. First he must define the problem propounded by the sales executives; that involves putting their general ideas into scientific or technical form, and often necessitates a good deal of addition and subtraction of "facts" quite apart from the information with which he is first provided, since those who are not scientifically trained are liable to get hold of the wrong story. He must then investigate methods of ascertaining the value of new products or processes or of new uses for old products; this is not always an easy matter since standards of comparison may not exist; he may therefore have to set up arbitrary standards, but the value of these arbitrary standards may in themselves be difficult to assess. Another phase of his work will be the comparison of the value of the products and processes of his firm with those of competing processes, and this again will involve setting up standards. Finally, the application research chemist must suggest new methods of application, new uses for existing products, and entirely new products; this work will be in addition to the ideas which are received from the sales staff.

It is evident that a research department working directly with the sales staff is considered in America to be of very considerable importance. In the export market it may well be of enormous importance, particularly if the application research chemist can make periodical visits abroad in order to study the needs of overseas customers. In smaller firms the research laboratory should already be undertaking this work, but in larger concerns the link here suggested will be necessary. It is an idea that the British chemical industry might well think over.

NOTES AND COMMENTS

Entry into Industry

THE beginning of a new academic year, coupled with the officially sponsored drive to bring recruits into scientific and technological industry, will soon introduce a large number of young chemists into the unfamiliar atmosphere of the chemical works. On a later page of this issue, therefore, we are publishing a few words of advice from an experienced works chemist—one whose experience is especially valuable, as he made a start in chemical industry at the beginning of the last war, when conditions were even more abnormal than they are to-day. On reading his words, we were struck with the notion that, after all, they amounted simply to sound common sense, and, as he says, the advice had all been given before, somewhere or other. Nevertheless, the publication of such material is both timely and useful, as there is an ever-present tendency among young scientific workers to be somewhat lacking in humility; indeed, it is inevitable that the best among them should suffer most from this defect, for obvious reasons. A few weeks in a works, however, will remedy the deficiency in all but an incorrigible few, and the new hands will soon settle down in the conditions of industry, which, of necessity, are unlike those of an instructional laboratory. A lot depends, of course, on the way in which the young chemist has been taught, and on his teacher. And, in a recent article in the *Journal of Chemical Education*, Dr. H. N. Alyea, of Princeton University, has briefly outlined the duty of a chemical teacher. It is his duty, he says, to imbue the next generation with the understanding and spirit of research; to point out the meaning of the first two syllables of the word *laboratory*; and to teach the value of the suspended judgment of the scientist. Haste is a fault and a virtue of youth; but youth is also blessed with adaptability, and the recruit who listens to the wise words of the "Old hands" will not find the passage into industry unduly rough.

Dominion Efforts

TOO often we are inclined to regard the war-effort of the Dominions in terms of expeditionary forces. Not the least side of their noble efforts lies in equipping their soldiers, and also adapting and developing their industries so as to produce the maximum of self-sufficiency. From Canada, Australia, and the Union of South Africa we learn of fresh endeavours. In Canada the shortage of petrol and a surplus of wheat has combined to stimulate a movement for the production of power alcohol from wheat, and other agricultural products. As a result of investigations conducted by the National Chemurgic Committee of the Canadian Chamber of Commerce a recommendation was made for the setting up of an experimental plant for the manufacture of this product from wheat. Information collected by the committee on the results of the research shows that alcohol may be blended with petrol up to the ratio of 2 per cent., without necessitating important changes in the carburettors of the motors, and that it provides anti-knock qualities comparable with those of tetraethyl lead. The octane rating of the blended fuel is said to be increased one point for each 1 per cent. of alcohol used in the mixture. It was suggested to the Government that the plant should be established in Western Canada, with a capacity of 10,000 gallons a day. If all the motor fuel used in the Dominion had a 10 per cent. content of alcohol made from wheat, it is estimated that 50,000,000 bushels would be used in a year. In addition to wheat, however, other grains, notably barley and corn, are said to be suitable sources for alcohol, though the most suited agricultural product is sugar beet. Australia has already embarked upon a scheme for producing alcohol from wheat. In Africa, the regeneration of used lubricating oils has been advised. This process has only recently been employed at a few centres of the Union. Besides this, recommendations have been made for the admission under rebate of duty of crude vegetable oils for refining in the country. Similar recommendations have been made with regard to manganese sulphate, which at present enters the Union subject to a 15 per cent. duty and chlorinated diphenyl. The one is used as for soil treatment and the other as a safeguard against fire.

Clean Air

SINCE the annual report of the investigation of atmospheric pollution by the Department of Scientific and Industrial Research for the year ending March 31, 1940, is not to be published in the usual way, a summary of the report of the Superintendent of Observations has been prepared for the information of the co-operating bodies. At the outbreak of war, observations with a number of instruments were discontinued, most of them temporarily. Some measurements for the year are therefore incomplete. The results obtained with the deposit gauges show that the deposit over the whole country, as represented by these gauges has decreased. The highest total deposit measured for the year (395 tons per square mile) was in Manchester, while the lowest measured (57 tons per square mile) was at Loggerheads; both places, however, show smaller deposits than in the previous year. There were only three complete sets of results with automatic filters, *viz.*: Cardiff, Coventry, and Stoke-on-Trent. The average monthly suspended impurity does, however, show interesting characteristics, notably maxima, in January, 1940, which it will be remembered was unusually cold. This increase in suspended impurity was no doubt due to an increase in all forms of domestic heating despite the shortage of fuel in some districts. All three places show a sharp increase in suspended impurity in October, followed by a minimum in November, although the average temperature for that month was lower than the average for the past 50 years or so. The continuation of summer-time till November 20, 1939, and the restriction on the combustion of fuel imposed by the fuel rationing scheme may be responsible to some extent for these minima in November. Complete results for the measurement of the concentration of sulphur dioxide by the volumetric method were obtained from the stations at London (Beckton and Crossness), Salford, and Sheffield. The averages from these stations are slightly lower than those for the previous year.

The Plasticity of Clays

THE plasticity of clays is a subject upon which much yet remains to be discovered. The ability of clay to be moulded and to retain a shape on drying and firing is the basis of the ceramic industry, but as a result of unexpected causes, defects frequently occur in articles manufactured from clay. These blemishes in general can be summarised as a change in the plastic properties of the clay during the process of manufacture. Those who are concerned with this subject will find much to interest them in a paper on the "Rheology of Clay" contributed by Mr. H. Macey to the August number of the *Journal of Scientific Instruments*. The clay minerals are composed of three main groups of hydrated aluminium silicates, all of which are found to have a sheet structure reminiscent of mica when examined by X-rays. The illite group is close to the micas and may be built up of layers of aluminium and oxygen and silicon and oxygen. The kaolinite group is composed of one of each of these layers in sheets, the whole being built up of such sheets separated by a gap of a few Ångstroms. The third group, the montmorillonite group, has an alumina layer bounded on both sides by silica layers. Here the bond between the sheets is weaker and X-ray diagrams suggest that water will build up in crystalline form and in integral numbers of layers between them. The plasticity of clays which is intimately connected with their moisture content is probably connected with the affinity between water and the silicate surface.

The Young Works Chemist

Advice from an Old Hand

HISTORY is repeating itself, and the requirements of war and the hopes of a post-war expansion of the chemical industry have resulted in works jobs for many young men straight from the university, just as the necessity for violent expansion in 1914 called into industry many with chemical training. There is more than one important difference however. To a great extent in 1914 the organic chemical industry had to be created from very small nuclei with a deficiency of experienced leaders, and to a great extent those of us who entered it then were pioneers who had to break new ground and had to learn by our mistakes, our very many mistakes. The training of most of us had been academic and few had learnt anything of that branch now styled "chemical engineering." The young graduates of 1941 have the great advantages of courses of study designed to fit them for industry and the initiation of their works careers under leaders who have acquired a quarter of a century of experience.

Even with these advantages, failures occur. Some of these are inevitable and have their origin in complete incompatability or complete unwillingness to fit into the conditions of industry. Help and advice from leaders is not always forthcoming, particularly to a man who seems to resent instruction. These few notes are penned as the result of a long industrial chemical experience in the hope that the adoption of the advice given will enable a few, who would otherwise fail, to achieve some measure of success. The advice given has all been given before somewhere, but an attempt has been made to leave out details which should follow and be apparent to any graduate of intelligence, and to confine these remarks to a few and important points, so that it will be easy both to remember and apply them.

Essential Attributes

Young chemists who have succeeded in industry have all possessed all or most of the following attributes or have had enough sense and ability to acquire them, and they can all be acquired by application if their importance is realised. The necessary fundamental technical knowledge is assumed, the mental tools which must, of course, be present to start with, a sound training in figures and chemistry, and a little electrical technology. High manipulative ability and mechanical ability, or at least mechanical training, are good to have, but not essential. First in importance comes industry and grit to carry a job to completion. The successful chemists I have known have all been keen enough on their work to think about it outside works hours, to finish off an experiment or stay on a plant at hours not insisted on by their employers, and have been willing to "talk shop" at all times with their colleagues. Francis Bacon pointed out the helpfulness of discussing a problem with a kindred spirit, and the effectiveness of this method cannot be over-emphasised.

Being Popular

Next, and of almost equal importance, is ability to get on with both those under you and those over you. Some are born with this faculty, but many have been known to acquire it by giving enough thought to their actions and curbing impetuosity. The desired ability can be acquired by considering the attributes that make men unpopular. Meanness, unwillingness to be taught anything by an inferior and sometimes even by a superior, and grousing about your work to all and sundry. Mention of grousing brings us to the man with a grievance: he never makes a success, so when you have a grievance never ventilate it, except to someone who has the ability to remove it. Everyone hates the man with a grievance even when pretending to sympathise with him, and he ends by getting sacked or shelved. The disloyal man is deservedly unpopular and immediately distrusted. His most obvious symptom is a tendency to short-circuit the line of organisation by attempting to approach a higher official without the full sanction of his immediate superior, or, worse still, to have confidences with his workmen without the knowledge of the foreman over them and under him.

Vacillation is a fault that irritates both your men and your superior, and you must acquire the courage of your convictions. You must think well about the instructions you give your foreman, so well indeed that you will not afterwards have to change them. Your experiments must be so adequate and sufficiently repeated that you can stick with confidence to your results through thick and thin, and not be talked out of them. Associated with this are the dangers of impetuosity, which undermines the confidence of all in you. If you get a startling result, repeat the experiment or consider it well before you tell the world, and if you have a brain-wave about a process, sleep on the idea before you pass it on.

A Social Duty

"Good mixing" with your fellows is easy and natural to some, and very, very difficult for others. If you do not possess this faculty, at least realise that to take a fair share in the welfare and social activities of your firm is just as much a part of your work as are your more defined duties. Play your social part in moderation and the "good mixing" ability will come in time.

Curiosity about the other fellow's job and trying to find out things you are not meant to know will soon get you treated at least with suspicion by your colleagues. Stick to your own job unless the other fellow asks for help and advice, and then give both to the best of your ability. But seek advice in your own problems. Your college training should have taught you how to work, but it is often found to be lacking in particulars very necessary for success in industry, especially in the planning of experiments. You have been taught, of course, to avoid varying more than one factor at a time, but this seems often to be interpreted into doing only one experiment at a time. Industry cannot afford such a rate of work. Most well organised firms insist on contemplated experimental work being written out in a schedule which states clearly its object and the method of attack. If the firm does not insist, then you are strongly advised to adopt it for all your work, and you should put in writing, too, the results you hope to get from each experiment. You should, of course, have enough sense not to start on any experimental work without first finding out all that has previously been done on the subject, from reports in your firm's possession and from the chemical literature. You know, of course, the importance of this, but it is surprising to find how often a proper literature search is neglected or scamped.

Enjoy Work

Finally, get clear in your mind your obligations to your employers and yourself. The object of your employers is to pay dividends to their shareholders, and in all your activities you must bear this in mind. On the other hand, you have obligations to yourself. You cannot do your duty to your employers without holidays and recreation, and a hobby that can fully occupy your mind at the right time is very valuable towards all-round efficiency. Avoid like poison the attitude of mind with which some young men enter industry, looking on it as a period of servitude leading to a far-off happy day when you will retire on pension. All your days in industry should and can be happy, and the best part of your life.

A new development reported by A. D. Little, Inc., is the production of a number of new products from the brines of Searles Lake, California. These materials, which represent 40 per cent. of the company's tonnage, include soda ash, salt cake, burkeite, bromine and bromides, potassium sulphate, and lithium phosphate.

GLASSES FOR DISCHARGE TUBES

The Importance of Luminescence

by BRUNO SCHWEIG, Ph.D.

DISCHARGE tubes made their first appearance only a comparatively short while ago, but they have already won a dominant place as lights for many and varied purposes, though the vast majority of these are suspended in this country during the war period. The reason for this quick extension of the use of discharge tubes is the brilliance of the light, the wide range of colours available, and, last but not least, the cheapness of this type of illumination. Whereas incandescent lamps convert most of the current energy into heat, the discharge tubes reproduce the electric power nearly completely as light rays. It can, therefore, hardly be considered rash to prophesy that after the war lighting tubes will supersede incandescent lamps on an ever-increasing scale. The rôle glass will play in this development is here reviewed in brief.

The tube suitable for being worked on by the lampblower to be formed into the desired shape and to be filled with gas is, as a rule, supplied in lengths of about 6 ft. and 1/25 to 1/15 in. thick with an outer diameter of 1/5 to 1 in. The glasses employed can be divided into four main groups:—

(1) Tubes of ordinary clear glass.
(2) Tubes of coloured clear glass.
(3) Tubes of opal glass.
(4) Tubes of luminescent glass.

It is obvious that combinations of these groups, *e.g.*, coloured opal glass, can be made, but for practical and historical reasons the four main groups may be considered first.

Advantages of Opal Glass

Tubes of ordinary clear glass transmit the visible light of the illuminating gases without change in colour and without appreciable absorption. They are easy to manufacture, have a good resistance to atmospheric attack, and are cheap. They are, therefore, still most widely used, although they are losing ground to the other types.

As is well known, gases emit a light consisting of a line spectrum, whereas sunlight gives a continuous band spectrum. Many attempts have been made to find a mixture of gases emitting lines or bands in all parts of the visible spectrum in order to provide a light similar to that of the sun, but no one has yet succeeded in doing so. In addition, the light of the gas discharge tube differs considerably in intensity in the various parts of the spectrum from that of daylight. Efforts, therefore, have been made to evolve means of securing such a light, otherwise than by mixing several gases. At the same time expedients to bring some variation into the monotony of the red, blue, and green light of the tubes have been searched for.

The first step in this direction was the employment of coloured clear glass. Light is filtered by tinted glass: so, when using a yellow tube filled with a mixture of neon and mercury, the blue is absorbed and the transmitted light is of a bright green colour. It is, however, evident that the light, having passed through a filter of coloured glass, has lost some of its intensity. Hence coloured glass tubes appear less efficient and darker as compared with tubes of clear glasses. This does not matter when it is desired to attain certain effects; and coloured tubes sometimes come in very handy.

Tubes of ordinary clear glass and of coloured clear glass have the disadvantage that they are very dazzling and therefore sometimes trying to the eyes. Further, the light transmitted vertically from the axis of the tube often has a colour or intensity different from that transmitted from the wall of the tube, while some light is lost by total reflection which prevents it getting out of the tube. The use of opal glass avoids all these disadvantages. The fine white particles, distributed evenly in the glass reflect the light of the luminous gas in a diffused manner, causing hardly any loss of absorption. A lighting tube of opal glass, therefore, appears of equal intensity of light and colour in all parts, and that is why an opal tube gives the impression of being enlarged to more than double its diameter, while all undesired glare is avoided. Opal glass tubes are often combined with others and sometimes protected by an outer tube of clear glass, as opal glass does not stand up so well to dampness and atmospheric influences.

A Recent Development

The most interesting development in the lighting tubes, and the most recent one, is the employment of luminescent tubes. Though these are only in their infancy, the results so far obtained are remarkable. Luminescence, as far as tubes are concerned, comprises both fluorescence and phosphorescence. Fluorescence is the property of certain substances to emit light when they are exposed to light rays, thereby absorbing most or part of the receiving light and radiating light of another wave-length, usually greater than that received. The colour of the original light is therefore altered by luminescent substances. More important, however, is the fact that invisible light, such as ultra-violet light, is transformed into light of greater wave-length and therefore changed into visible light.

The reaction is based on the atomic structure of matter. If radiated energy is absorbed by a substance, chemical work can be produced, thermal agitation may be increased, or the atoms brought to a higher level of energy. Electrons are brought to orbits further away from the nucleus of the atom. The atoms are in a critical state, less stable than their initial state, and have a tendency to return to their original condition. The return of the electrons to their primitive plane of orbit is accompanied by the emission of light. This return can be instantaneous, or the electrons may remain in the excited state for some time. If the return is immediate, the emission of light takes place only during the exposure of the substance to light rays. We then speak of fluorescence. If the return is retarded, the emission of light continues for some time after the exposure to light rays has ceased. This is called phosphorescence. Sometimes the stability of the atoms in the new (activated) state is so great that they return to the original state only, after the excitation has stopped, under the influence of heat, *i.e.*, if the temperature of the luminescent substance is raised. To this phenomenon the name of thermo-luminescence or thermo-phosphorescence has been given.

Luminescence

Here we are concerned only with fluorescence, *i.e.*, emission of light of another wave-length from a substance radiated upon by visible or invisible (ultra-violet, cathode, etc.) rays, and with phosphorescence or afterglow. Very often the distinction between fluorescence and phosphorescence is hardly perceptible, and hence is of no account in ordinary luminous tubes. When, therefore, we speak of glasses as luminescent it must be understood as including both fluorescence and phosphorescence.

Luminescent glasses are obtained by uniting molten glass with luminescent material. Luminescent powders, such as are used for luminous paint, cathode-ray tubes, etc., have been known for some time. The writer remembers well that in his childhood forty years ago his attention was attracted and his imagination aroused by an ash-tray magically glowing with a dim bluish-green light in a dark room. The composition of the luminescent glasses was naturally based on experience with luminous powder. Indeed, some tubes are manufactured by embedding luminescent powders in their inner walls. Modern

practice, however, tends to incorporate the luminescent material in the glass. Luminescent substances are already available in a great variety of composition. As far as luminescent glasses are concerned four groups are mainly employed :—

(1) Uranium glasses.
(2) Glasses containing simple or compound sulphides of alkali earths, zinc, cadmium, etc.
(3) Glasses containing special silicates or tungstates, *e.g.*, zinc silicates.
(4) Glasses combining zinc, cadmium, calcium, etc., sulphides with various heavy metals or rare earths.

Usually a foundation material is coupled with an activating substance of which only a very small amount is necessary. Manganese, copper, bismuth, thallium, etc., are employed for this purpose. Numerous patents cover a series of the glasses in use. Some tubes produced in this country are superior in colour and brilliance to those manufactured abroad. The development of luminescent glasses is, however, still in progress and, though interrupted at present, will certainly be resumed after the war.

The reason for using luminescent discharge tubes is easily explained. It has already been explained that discharge tubes reproduce nearly all the consumed electric energy in the form light rays. That is true with the reservation that not all the light rays emitted are visible. With some tubes, especially with those containing mercury vapour, the greater part of the energy is transformed into invisible ultra-violet rays. These, however, are just the rays most apt to excite luminescent materials. Therefore by employing luminescent tubes the invisible ultra-violet rays, otherwise lost, are changed into visible light. The effect of the tubes is thus increased up to 300 per cent.

But that is not all. The characteristic of luminescence whereby it alters the wave-length of light is most important; by using suitable luminescent glasses all colours of the spectrum can be produced; they can be distributed over the spectrum, and their strength regulated, in such a way that even white light very similar to that of the sun can be produced. The line-spectra of the gases can be changed into band-spectra, which, because of their even distribution, are more agreeable to the eye. Therefore, the luminescent discharge tube in its ideal form is distinguished by economy, beauty, and comfort.

The main use of the tubes is, of course, for lighting purposes, but luminescent glass can be used in other fields as well. It happens with X-ray tubes that stray rays leave the tube unnoticed and cause damage. Tubes of luminescent glass would shine where they are hit by the straying rays. Cathode tubes for television and oscillographs can make use of luminescent glass. To some extent luminescent glass could be substituted for luminous paint. It also serves decorative purposes.

A CHEMIST'S BOOKSHELF

THE INDUSTRIAL CHEMISTRY OF FATS AND WAXES. By T. P. Hilditch, D.Sc., F.I.C. 2nd Edition. London: Baillière, Tindall & Cox. Pp. 532. 15s.

Since the first edition of this invaluable text-book was published in 1927, the size has increased by some 60 pages and the price has been reduced by three shillings. This latter figure, we hope and expect, is an indication that the merit of the book has been recognised, since, as we can still unhesitatingly quote from our review of the earlier edition, "the book undoubtedly fulfils a real need as one from which reliable knowledge of important facts about fats and oils can be quickly and readily obtained." The book, incidentally, is now published as a separate monograph and not as one of a series of text-books on industrial chemistry.

Technological developments and chemical knowledge in the field covered have made considerable advances since 1927, and the expansion of the volume deals fully with the progress made in this branch of industrial chemistry. The section on "sulphonated" oils (which have received considerable attention in recent issues of THE CHEMICAL AGE) admirably summarises the present state of knowledge. It is a pity that the term "sulphonated" has crept into industrial practice, as the oils concerned are not sulphonated but sulphate. Professor Hilditch calls attention to this error, but does not make the pedantic mistake of ignoring current nomenclature.

In our review of the first edition we noticed a number of minor flaws, mainly typographical. It is gratifying to note that these have all been eliminated, but we still consider that it would be a convenience to have the references to current literature grouped together in one place. Industrially speaking, it would have been interesting to read an authoritative account of the use of castor oil with nitrocellulose in artificial leather manufacture; but perhaps that is beyond the scope of the book.

Such minor details, in any case, have little bearing on the high value of Professor Hilditch's work. This book remains an essential in the library of the industrial chemist.

"Nicrex" is the name of a recent addition to the Murex range of electrodes for welding high nickel-chromium steels. It is resistant to corrosion and the effects of high temperature and has wide application for the repair and maintenance of plant, where these qualities are desirable. This information is contained in Leaflet No. M21 published by the MUREX WELDING PROCESSES, LTD., Waltham Cross, Herts.

Citrus Dehydration

Problem of Vitamin Retention

INDICATIONS that the dehydration of citrus fruit without the destruction of the vitamin-C content is not an insoluble problem were given by the superintendent of the Low Temperature Research Laboratories, Cape Town, to a representative of the *Cape Times* last week.

When this problem is solved, a solution will also have been found for the economic disposal in war-time of South Africa's orange crop. As it is, some 35,000 cases, containing $5\frac{1}{2}$ million oranges, have been distributed free among the poor of Cape Town. When dehydration without loss of vitamin content can be accomplished, it will be possible to send to Great Britain supplies of orange powder retaining the full vitamin-C power of the fresh fruit.

There is already a considerable export of the fruit pulp, which is used for marmalade. Concentrated orange juice was, till recently, sent to South African troops in the Middle East. However, they are now supplied from Palestine and therefore the surplus is available for shipment to Great Britain. The loss of flavour in the concentrated juice can be compensated by the addition of oil extracted from the peel, and the production of a concentrated juice which retains the full vitamin-C content is the principal problem outstanding.

Miscellaneous Chemicals Control

Established in London

THE Miscellaneous Chemicals Control has been established at Iron Trades House, 1 Chester Street, Grosvenor Place, London, S.W.1, to deal with certain chemicals, hitherto administered directly by the Raw Materials Department, Warwick. Mr. D. J. Bird, until recently Deputy Controller of Fertilisers, has been appointed Controller.

Responsibility for the following chemicals has been transferred to the Control and correspondence concerning them should be sent to the Controller at the above address: titanium dioxide; chromium pigments and compounds including bichromates, chromates, chrome oxide and chromic acid; and chlorates. Correspondence on other miscellaneous chemicals should continue to be addressed to the Raw Materials Department, Ministry of Supply, The Castle, Warwick.

Personal Notes

MR. RALPH HARRY KENYON, F.I.C., has become engaged to Dr. Marjorie Landau, of Gatley, Manchester.

PROFESSOR PILAT, 70 years old and an authority on oil, is among the sixty professors of the University of Lwow who have been arrested by the Gestapo. Their fate is unknown. PROFESSOR BARTLE, a mathematician and three times Prime Minister of Poland, was shot in this latest persecution of Polish scientists and professors.

MR. W. J. DARBY, who joined the board of Lewis Berger and Sons, Ltd., in May, has now been appointed managing director. Mr. W. H. F. STARKEY, joint managing director of the firm with Mr. P. C. V. GRIGSBY since 1930 has resigned after 46 years' service. Mr. Grigsby has also resigned from his office, but has been asked to retain his seat on the board.

MR. HAROLD HERON has arranged to take over the practice of consultant to the brewing trade of the late Mr. H. Lloyd Hind, B.Sc., F.I.C., whose death we announced in our issue of July 12. He has also decided to take MR. A. J. CURTIN COSBIE, B.Sc., into partnership, the two practices in future being conducted under the title of Heron & Cosbie.

DR. D. H. HEY, D.Sc., Ph.D., F.I.C., of the Department of Organic Chemistry, Imperial College of Science and Technology, South Kensington, and previously of Manchester University, will take charge of the British Schering Research Laboratories, Ltd. This is one of the three new companies, each complimentary to the other two, of the British organisation lately formed to take over the German Schering interests in this country.

Obituary

MR. ALEXANDER M. JOHNSTON, who recently died at his home in Aberdeen, was secretary of Messrs. John Miller and Co., Ltd., Sandilands Chemical Works, Aberdeen. He joined the firm shortly after the Great War.

ENGINEER-CAPTAIN J. FRASER SHAW, R.N. (retired), who died recently, was chief engineer of the Fuel Research Station of the D.S.I.R. at East Greenwich since its inception in 1922, having been seconded from the Navy in order to take over that important post. His death is an irreparable loss to the fuel industry, as it was mainly due to his inspiring leadership that the work carried out at the Fuel Research Station has been so constantly fruitful.

Report on Labour Problems

Select Committee's Recommendations

THE 21st report of the Select Committee on National Expenditure, recently published (price 4d.), gives details of an inquiry into the labour problems of the war industries. In compiling the report, the Committee took evidence from the Ministries of Labour, Supply, and Aircraft Production and from the Admiralty; representatives of the Ministry of War Transport were also heard.

Among the 32 recommendations are that the workers should have one day's rest in seven, although the factories and plants should, it is contended, be in use for as much of the 24 hours as possible. Managements are advised to take their employees more closely into their confidence, particularly when there is a temporary lack of work. Foremen and charge-hands should be appointed to positions of authority not only on account of their technical skill, but also for their qualities of leadership, tact, and organising ability. Another recommendation is that passes should be issued to workpeople, giving them priority on certain transport services to facilitate their travelling to and from work.

In general, the report points out that the nation's manpower is limited and that labour shortages have been felt for some time. Therefore the individual must work his hardest. Increased output can be obtained in this way and also by improvements in organisation on the part of the managements.

British Chemical Prices

Market Reports

VERY firm price conditions continue to operate on practically all sections of the general chemicals market and activity during the past week has been fairly widespread. Contract deliveries are reported to cover good volumes and a steady flow of fresh inquiry has been put through both for home and export account. There has been no substantial change in the position of the potash and soda products which remain steady and much the same can be said of the heavy acids and solvents. Movements in the coal tar products market have been more or less on the same lines as during recent weeks. Spot offers of cresylic acid are almost unobtainable and contract deliveries absorb the available supplies of carbolic acid crystals. Toluol and xylol are in steady request and pyridine is enjoying fair inquiry.

MANCHESTER.—Strong price conditions continue in evidence in most sections of the Manchester chemical market and the future general trend will undoubtedly be towards higher levels. The demand for chemicals for the bleaching, dyeing and finishing trades at the present time is being adversely influenced by holidays at Lancashire and Yorkshire consuming centres, though the movement of supplies against contracts is on a fair scale, whilst a steady demand is reported for rubber chemicals and most other leading lines. The demand for most of the by-products, chiefly against existing commitments, is well maintained, and values are very firm.

GLASGOW.—There is again no change in the Scottish heavy chemical trade during the past week. Business is maintaining its steady transactions for spot delivery. Export inquiries are rather limited still. Prices remain firm.

Price Changes

Carbolic Acid.—Crystals, 9½d. to 10¾d. per lb.; crude, 60's 3s. 3d. to 4s. 6d., according to specification. MANCHESTER: crystals, 10½d. per lb., d/d; crude, 3s. 10d. to 4s. 1d., naked at works.

Cresylic Acid.—Pale, 90/100%, 3s. per gal. MANCHESTER: pale, 99/100%, 4s. per gal.

Naphthalene.—Crude, whizzed or hot pressed, £14 per ton; purified crystals, £23 per ton in 2 cwt. bags; flaked, £27 per ton. Fire-lighter quality, £7 10s. to £8 10s. per ton ex works. MANCHESTER: refined, £27 per ton.

Pyridine.—90/140, 18s. per gal.; 90/160, 14s.; 90/180, 4s. to 5s. per gal., f.o.b. MANCHESTER 14s. to 18s. 6d. per gal. naked.

Canadian Chemical Production

New Committee between Canada and the U.S.

THE Hon. C. D. Howe, Dominion Minister of Munitions and Supply, recently disclosed that plans for establishing a committee between Canada and the United States, to co-ordinate the explosives and chemical production programmes of the two countries, were complete. There is a general shortage of chemicals and explosives in North America. Mr. Howe also revealed that 16 of the 19 chemical and explosive plants authorised under the present re-armament scheme are in production, some exceeding their rated capacity. Six others are scheduled to begin production this autumn, and the other plant, a small one, some time later. As was stated in our issue of May 10, only eight of the nineteen projects were then operating. Approximately 85 per cent. of the construction work of the programme has been completed; the building of explosive plants is largely finished and, with one exception, the construction of chemical units were due to be finished in the early part of this month.

UTILISATION OF MAGNESITIC DOLOMITE

The magnesitic dolomite deposit at Kilmar (Que.), Canada, has once again become important as a war material. This obscure deposit, although discovered in 1900, was not exploited until Austrian supplies became difficult to obtain in 1914 and production rose to 52,434 tons in 1918. Recent discoveries have found the high content of lime of the mineral to be an asset rather than a drawback for refractory purposes. Experiments conducted by the National Research Council and certain Canadian firms are said to have resulted in the conversion of the lime into a new chemical which gives longer life to the furnace lining as well as greater ease of application.

General News—From Week to Week

Widnes I.C.I. Recreation Club can boast of the splendid achievement of having raised over £100 for various war charities during the past nine months.

The three-storey building of Brook, Parker and Co., Ltd., manufacturing chemists, Bradford, was completely gutted, when fire broke out there last week.

The supply branch of the Industries and Manufactures Department 2, Board of Trade, has removed from Granville Court, Bournemouth, to Marsham Court, Bournemouth.

Tampimex Oil Products, Ltd., expect their Cumberland barytes mine, which they acquired some time ago, to be in production this autumn.

The rate of premium payable under any policy of insurance issued under the Commodity Insurance scheme, during the period beginning September 3 and ending December 2, will continue to be at the rate of 7s. 6d. per cent. per month.

The Board of Trade announce that they have issued an Order (S.R. and O. 1941, No. 1156, price 1d.) whereby the provisions of the Trading with the Enemy Act, 1939, no longer apply to Syria and the Lebanon as they apply to enemy territory.

The Board of Trade has made an Order, the Export of Goods (Control) (No. 30) Order (S.R. and O., No. 1260, 1941) prohibiting as from August 26, all exports to Iran, except under licence. At the same time all outstanding export licences for this destination have been revoked.

Consideration is being given to a pooling scheme involving 400 motor vehicles for the transport of oils such as crude and refined oils, edible oils, glycerine, caustic liquor, lubricating oils, molasses, etc. In a memorandum formulated by the Road Tank Haulage Board, it was stated to be essential that the vehicles should operate as one unit.

The Trading with the Enemy (Specified Persons) (Amendment) (No. 14) Order, 1941, contains two additions of chemical interest, namely, Sociedad Nacional de Industrias y Aplicaciones de Celulosa Espanola (S.N.I.A.C.E.), of Alcala 23, Madrid, and at Torrelavega, Santander; and Officine del Gottardo S.A. für Elektro-Chemische Industrie of Bodio, Tessin, Switzerland, to the list of persons and firms in neutral countries with whom trading is illegal.

Foreign News

The sulphur deposits, which were recently discovered in Baluchistan, India, are about to be utilised.

The Sudan Government have informed the Board of Trade that from August 1 all imports into and exports from the Anglo-Egyptian Sudan are subject to licence.

A new acid plant is to be constructed immediately at Hull, Quebec, in which Canadian pyrites will be used instead of imported sulphur in the manufacture of chemical pulp. The plant is scheduled to begin operations early next year.

Two factories for the production of aluminium are being erected near Sundsvall, Sweden. One is for the production of aluminium oxide and the other for the production of the metal from the oxide.

An open general licence covers the importation into Ceylon of the following goods of United Kingdom origin: Formic and acetic acid, sodium bisulphite and other bleaching materials, permanganate of potash, sulphur, chemicals not otherwise specified in the customs tariff, excluding potassium chlorate, synthetic essential oils, and saccharine, and essential oils other than citronella oil

Plans for the erection of a plant in Canada for the manufacture of polyvinyl chloride are being prepared by Shawinigan Chemicals, Ltd. The chemical finds its greatest use in the covering of cable, especially degaussing cables for submarine protection. It is resistant to acid and water and far less bulky than rubber. The plant is expected to be operating early in 1942.

The Union Oil Co., of Oleum, California, has begun the production of high melting point, fully refined petroleum waxes, with melting points which range between 63° and 66° C., and 71° and 74° C. Employed primarily as waterproofing agents for paper containers, wrappings, and cardboard cartons, the waxes also find application as rubber softeners.

The largest proportionate increase in value of the chemical group of Canadian manufactures for the year 1940 was in hardwood distillation at 42 per cent. ($737,700 to $1,047,000), with coal tar distillation second at 36 per cent. ($3,648,000 to $4,976,000), and acids, alkalies and salts third at 31 per cent. ($23,057,000 to $30,199,000). The total value of production was announced in our issue for July 19 at $184,153,000.

The following items are among those which may be imported into Argentina, under the new import regulations which became effective from July 1, without the requirement of import permits and without limitation of quantity: resin; all acids except tartaric, boric and impure nitric; turpentine; alkaloids; aluminium powder; most chemicals, drugs, medicines; and calcium carbide.

Forthcoming Events

A meeting of the Refractory Materials Section of the **British Ceramic Society** will be held at the North Staffordshire Technical College, Stoke-on-Trent, on **September 8, at 11.30 a.m.,** under the chairmanship of Mr. J. W. Fagan, when three papers entitled "The Effect of Increasing Heat Treatment on the Properties of a Diatomaceous Insulating Brick," "Shetland Chromite as a Refractory Material," and "Some Requirements of Casting Pit Refractories" will be read. All interested are cordially invited to attend. The annual meeting of the Society will follow at 6 p.m.

A meeting of the London Section of the **British Association of Chemists** will be held at the Café Royal, Regent Street, W.1, on **September 13 at 2.30 p.m.,** when Mr. T. McLachlan, D.C.M., A.C.G.F., F.I.C., will open a discussion on "The Training of the Chemist." Mr. W. C. Peck, M.Sc., A.I.C., M.I.Chem.E., will be in the chair. The meeting is open to members of kindred societies.

Lactic Acid for Mexico

U.S.A. Captures German Market

BEFORE the outbreak of war Germany was the chief supplier of lactic acid to the Mexican market. The United States has now taken over practically the whole market from Germany, the Netherlands, and Italy, states a report from the Canadian Trade Commissioner. The following table shows the importation of lactic acid into Mexico from the chief sources of supply for the years 1939, 1940, and the first two months of 1941:—

	1939		1940		Jan.-Feb. 1941	
	Kilos	Pesos	Kilos	Pesos	Kilos	Pesos
Total	22,437	45,584	32,970	76,668	1,326	3,217
Germany	11,726	26,043	345	1,474	—	—
United States	6,593	11,830	31,620	72,645	1,326	3,217
Netherlands	3,200	5,281	—	—	—	—

Buyers of this product in Mexico are jobbers and tanners. The type required for the market must be of a light colour and of 80 per cent. concentration. In view of the fact that duties are assessed on the basis of gross weight, it would be useless to offer lactic acid in the Mexican market with any other specifications. Lactic acid is shipped from the United States in barrels containing 505 lb. net and weighing 595 lb. gross. These barrels are $35\frac{1}{2}$ in. high and $25\frac{1}{2}$ in. in diameter. The American prices of this product range round 13 cents United States currency per pound, f.a.s. New York. Exporters would have to compete with this price and should preferably quote c.i.f. Vera Cruz. The Mexican duty on lactic acid is 10 centavos per kilo legal weight (approximately $\frac{1}{4}$d. per lb.).

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

Acetylation of hydroxy esters with ketene.—American Cyanamid Co. (United States, Sept. 27, '40.) 9197.

Dyes and dyeing.—C. S. Argyle. 9299.

Manufacture of organic compounds.—C. S. Argyle. 9300.

Dyes and dyeing.—C. S. Argyle and S. A. Gibson. 9298.

Manufacture of plastic materials.—W. Baird and Imperial Chemical Industries, Ltd. 9191.

Production of pulp from cellulosic material.—J. B. Beveridge and R. D. Kehoe. (United States, Aug. 7, '40.) 9318.

Manufacture of cellulosic sheet materials.—British Cellophane, Ltd. (United States, July 23, '40.) 9133.

Coating compositions.—British Insulated Cables, Ltd., and J. F. Cowen. 9290.

Plastic compositions.—Carbide and Carbon Chemicals Corporation. (United States, June 25, '40.) 9285.

Manufacture of moulded articles.—V. Christophers, 9164.

Dyeing of textile fibres.—Courtaulds, Ltd., and C. C. Wilcox. 9032.

Adhesives.—W. C. Dearing. (United States, July 18, '40.) 9282.

Manufacture of synthetic plastic materials.—Distillers Co., Ltd., H. P. Staudinger, and H. M. Hutchinson. 9357.

Manufacture of acetic anhydride.—Distillers Co., Ltd., H. P. Staudinger, K. H. W. Tuerck, and E. H. Brittain. 9358.

Granulation of fertilisers.—E. I. du Pont de Nemours and Co., Ltd. (United States, July 20, '40.) 9192

Preparation of condensation products.—E. I. du Pont de Nemours and Co. (United States, July 24, '40.) 9291.

Resinous moulding compositions.—E. I. du Pont de Nemours and Co. (United States, July 23, '40.) 9292.

Electrolytic recovery, etc., of manganese.—C. E. Every (Electro Manganese Corporation). 9337

Production of organic disulphides.—J. A. Gardner and Monsanto Chemicals, Ltd. 9211.

Sulphanilamide derivatives.—E. Haworth, F. L. Rose, and Imperial Chemical Industries, Ltd. 9245.

Polymerisation of rosin and its esters.—Hercules Powder Co. (United States, Feb. 21.) 9125.

Process for purification of gases.—Hercules Powder Co. (United States, Dec. 19, '40.) 9261.

Manufacture of pentaerythritol tetranitrate.—Hercules Powder Co. (United States, March 29.) 9262.

Insecticides.—Hercules Powder Co. (United States, May 23.) 9263.

Processes of treating sugar beet juices.—Holly Sugar Corportion. (United States, July 31, '40. 9345.

Manufacture of solutions of decomposition products of saccharides.—Howards and Sons, Ltd., and R. H. Lock. 9235.

Manufacture of lactic acid, and salts thereof.—Howards and Sons, Ltd., and R. H. Lock. 9236.

Hardening of films of paint, varnish, etc.—Imperial Chemical Industries, Ltd., and A. C. B. Mathews. 9092.

Manufacture of explosive compounds.—H. Jackson, F. D. Miles and Imperial Chemical Industries, Ltd. 9294.

Manufacture of compositions from vulcanisable gums.—Monstanto Chemical Co. (United States, July 23, '40.) 9212.

Methods of dressing, etc., textile materials.—N. V. Chemische Fabriek Servo and M. D Rozenbroek. 9216.

Manufacture of derivatives of pyrazoline.—H. B. Nisbet. 9064.

Manufacture of organic condensation products, etc.—Permutit Co., Ltd. (Permutit Co.). 9268.

Chlorination of metal-bearing materials.—Pittsburgh Plate Glass Co. (United States, March 15.) 9332.

Low-carbon ferro-alloys.—E. A. Pokorny. 9151.

Production of laminated flexible sheet materials.—Pollopas Patents, Ltd., and H. E. Dawson. 9117.

Manufacture of phosphoric acid esters of hydroxy-tetrahydro-dibenzopyrans.—Roche Products, Ltd., F. Bargel, A. L. Morrison and H. Rinderknecht. 9135.

Production of phosphorescent materials.—S. Rothschild. 9074.

Manufacture of asbestos cement pipes.—Ruberoid Co. (United States, Aug. 3, '40.) 9048. (United States, Aug. 3, '40.) (Cognate with 9048.) 9049.

Mineral oils for use as lubricants.—Shell Development Co. (Australia, Aug. 7, '40.) 9209.

Luminous compounds.—S. Speyer. 9070.

Production of glycerine.—T. Spitzer. 9144.

Process for transferring thermoplastic films to surfaces.—Sylvania Industrial Corporation. (United States, July 19, '40.) 9069.

Apparatus for degreasing, etc., articles.—A. H. Tod. 9035.

Preparation of organic compounds.—W. W. Triggs (Du Pont de Nemours and Co.). 9317.

Complete Specifications Open to Public Inspection

Manufacture of litmus dyestuff.—Takeda Kagakuyakuhin K. K. Jan 15, 1940. 12242/40.

Method of heat-treating nickel-base alloys.—Haynes Stellite Co. Jan. 16, 1940. 15921/40.

Process of manufacturing articles of sintered metals or refractory (hard) alloys.—A.B. Hammarbylampan. Jan. 18, 1940. 17365/40.

Textile oils.—A. C. Goodings, H. B. Marshall and H. W. Lemon. Dec. 21, 1939. 17855/40.

Method and apparatus for the production of foamed aqueous dispersions of rubber or the like.—United States Rubber Co. Jan. 19, 1940. 363/41.

Treatment of acetic acid.—Usines de Melle. Jan. 13, 1940. 385/41.

Manufacture of tetracyclic compounds.—Soc. of Chemical Industry in Basle. Jan. 17, 1940. (Cognate Applications, 559-561/41.) 558/41.

Manufacture of saturated and unsaturated pregnanepolycarbonyl compounds and substitution products thereof.—Soc. of Chemical Industry in Basle. Jan. 17, 1940. (Cognate application, 662/41.) 661/41. Jan. 17, 1940. (Cognate application, 664/41.) 663/41.

Synthetic resinous compositions.—British Thomson-Houston Co., Ltd. Jan. 20, 1940. 737/41.

Process for the preparation of plastic masses, and products obtained thereby.—Ges. zur Verwertung Chemisch-Technischer Verfahren. Jan. 15, 1940. 1489/41.

Complete Specifications Accepted

Process for the manufacture of adiponitrile.—P. May (Soc. des Usines Chimiques Rhône-Poulenc). Aug. 29, 1939. 537,954.

Making cellulosic materials and textiles of wool or silk crease-resistant, and, optionally, also water-repellent.—E. I. du Pont de Nemours and Co. Nov. 14, 1938. 537,971.

Process for the preparation of diphenyl ethylene derivatives. Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. (Dr. Kereszty and Dr. Wolf). Jan. 5, 1939. (Cognate application, 32422/39.) 537,976.

Production of glycollic acid derivatives.—E. I. du Pont de Nemours and Co. Jan. 11, 1939. 537,980.

CONTENTS

Company News

Anchor Chemical Co., Ltd., have declared an interim dividend of 10 per cent. (same) for year to November 30, 1941.

The directors of **Lacrinoid Products, Ltd.**, have declared an interim dividend of 4 per cent. (3 per cent.).

Benzol and By-products, Ltd., announce a dividend of 3 per cent. on the six per cent. cumulative participating preference shares for the six months to March 31, 1930.

Minimax, Ltd., announce a trading profit for 1940 of £66,107 (£61,972), and have declared a final dividend of 8 per cent., and a bonus of 4 per cent., making 20 per cent. (same).

The United Glass Bottle Manufacturers, Ltd., are paying an interim dividend (for the fifth successive year) of 3½ per cent., less tax, on the ordinary shares. For several years past interim payments have been followed by a final of 6 per cent. and a bonus of 2½ per cent.

The directors of **Eastwoods Cement, Ltd.**, have declared a final dividend of 7½ per cent., making 12½ per cent. for the year ended March 31. A preliminary statement shows that the trading profit for the year amounted to £45,058 (£42,747), and the net profit to £28,537 (£28,331).

A payment of 3 per cent. on account of arrears of dividend on the first preference shares is announced by the directors of the **Harben's (Viscose Silk Manufacturers), Ltd.** The last published accounts of the company to April 30, 1940, showed that the dividend on the first preference shares had been paid to July 31, 1930, and on the second preference to April 30, 1930. No dividend has yet been paid on the ordinary capital.

The directors of **The Gas Light and Coke Company** have decided that consideration of the accounts shall be deferred until the accounts for the year 1941 are available. In the meantime no announcement can be made with regard to dividends on the capital stocks of the company. Last January, it was announced that payment of preference dividends for the half-year to December 31, 1940, had been deferred.

New Companies Registered

G. M. (London), Ltd. (368,763).—Private company. Capital, £100 in 100 shares of £1 each. Manufacturing, research, and analytical chemists, manufacturers of and dealers in fertilisers, plastics, synthetic products, etc. Subscribers: Wm. G. Curtis and L. C. J. Green. Registered Office: Vereker Buildings, Rathbone Place, W.1.

British Schering, Ltd. (368,654.)—Private company. Capital: £100,000 in 100,000 shares of £1 each. Manufacturers of and dealers in medicinal, bacteriological, industrial, horticultural, agricultural, veterinary and other preparations and proprietary articles. Subscribers: K. J. Wyman-Smart and A. E. Hutton. Solicitors: Roney & Co., 42-45 New Broad Street, E.C.2.

British Schering Manufacturing Laboratories, Ltd. (368,697). Private company. Capital: £10,000 in 10,000 shares of £1 each. Manufacturers of and dealers in bacteriological, biological, chemical, industrial, horticultural, agricultural, veterinary and other preparations, oils, pigments, varnishes, dyeware, etc. Subscribers: A. E. Hutton; K. J. Wyman-Smart. Solicitors: Roney & Co., 42-45 New Broad Street, E.C.2.

Burton Extractors, Ltd. (368,817).—Private company. Capital, £10,000 in 10,000 shares of £1 each. Objects: to adopt an agreement with Merz Patents, Ltd., and Victor Merz, and to acquire inventions relating to the extraction of oils, oil products, greases, rubber, chemicals, etc. Directors: W. B. Briggs, J. P. Smith, and V. Merz. Registered office: Dallow Works, Burton-on-Trent.

A. T. Laboratories, Ltd. (368,550).—Private company. Capital: £1000 in 1000 shares of £1 each. To experiment with plastic minerals, metals and materials, to manufacture and deal in articles produced from such materials, and bodies, colours and colouring matter suitable for colouring plastic materials and articles made therefrom, etc. Subscribers: R. H. Marshall and G. A. Aughton. Solicitors: Brown, Turner and Co., 11 St. George's Place, Southport.

Distillation and Carbonisation Company, Ltd. (368,476).—Private company. Capital, £100 in 100 shares of £1 each. Manufacturers of and dealers in distillation and carbonisation products, charcoal, coal, carbon, fuel, tars, acetates, naphtha compounds, chemicals, paints, drugs, fertilisers, plastics, synthetic products etc. Directors: Capt. Arthur E. C. Harris, M.C., Isador Goldberger, Edmund Goldberger. Solicitors: King-Hamilton and Co., 80/82 Wardour Street, W.1.

Chemical and Allied Stocks and Shares

ALTHOUGH less active, Stock Exchange markets have shown a firm undertone, and at the time of writing, the majority of movements in security values, although small, have been in favour of holders. Absence of selling was again an important factor, because owing to the firmness with which stocks and shares are held, long-term possibilities of recovery in earnings and dividends may tend to play as important a part in influencing market sentiment as the more immediate dividend outlook. This explains why the recent improvement in market values has been fairly widespread in character, and has not been confined only to shares of companies benefiting from activities essential to the war effort.

Chemical and allied securities have been very steady, and in many instances movements on balance did not exceed more than a few pence, but individual features of interest were not lacking. Imperial Chemical, however, were 31s. 3d., compared with 32s. a week ago, the disposition being to await the interim dividend, although there are confident expectations that this will again be 3 per cent. On the other hand, I.C.I. 7 per cent. preference were firm at 32s. 6d. B. Laporte ordinary were around 60s., and Fison Packard 33s. 9d. Lever and Unilever were steady at 25s. 6d. Moreover, awaiting the interim dividend announcements, British Oxygen and British Aluminium kept their recent gains to 67s. 6d. and 47s. 6d. respectively. Continued activity in British Plaster Board shares at around 17s. was accompanied by talk of a possible increase in the interim payment, although this is not generally expected in the market. Distillers ordinary units showed continued firmness at 68s. 6d., while United Molasses 10s. shares were better at 26s. 7½d. on the assumption that there are reasonable hopes of 22½ per cent. again being paid for the year. The possibility of a better dividend payment for the past financial year was again reflected by further improvement to 25s. 9d. in Wall Paper Manufacturers deferred units. Elsewhere, Barry and Staines were active, and at 36s. were 1s. 3d. higher on balance, while Nairn and Greenwich remained firm at 58s. 9d. Borax Consolidated deferred at 29s. were 6d. better on the week, and General Refractories at 10s., and Imperial Smelting at 12s. 6d., held their recent gains. Murex were firm and higher at 90s., the prevailing view being that results for the financial year ended June 30 are likely to show the maintenance of the dividend at 20 per cent., which has ruled for each of the four previous years. On the last occasion this rate was very conservative, as approximately 37 per cent. was earned on the ordinary shares. Goodlass Wall 10s. ordinary were better, dealings up to 12s. having been recorded. United Glass Bottle kept firm at 53s. 9d., aided by the maintenance of the interim dividend at 3½ per cent. Triplex Glass remained more active, and although best prices recorded during the past few days were not held, were better on balance at 22s. 10½d., on hopes of some improvement in the results, due next month. Valor ordinary shares transferred around 32s., and business at 53s. 9d. was recorded in Bryant and May preference shares. British Match ordinary shares were again 35s. Lawes Chemical transferred at 7s., and Lacrinoid Products were 1s. 4½d. on the larger interim dividend.

Various iron and steel securities were inclined to ease following their recent improvement. Stewarts and Lloyds were, however, better at 47s. 1½d., and Tube Investments firm at 94s. 9d., the market being hopeful that the final dividend of the last-named, due in October, may again keep the total distribution at 23¾ per cent. United Steel were steady at 23s. 6d.; results of this company are also due in October.

Boots Drug 5s. shares were quoted at 35s. 6d., and Beechams Pills 2s. 6d. deferred shares, which remained under the influence of the financial results, were firm at 9s. Elsewhere, Sangers were 16s. 3d., and Timothy Whites 20s. 6d. British Drug Houses were again 22s. 6d., as were Monsanto Chemicals 5½ per cent. preference shares. Oil shares were better, under the lead of a sharp rally in Anglo-Iranian.

A variant of the usual method of foundation-stone laying was witnessed recently when Dr. T. S. Gates, President of the University of Pennsylvania, tightened a nut to secure in position the first structural steel column of the new chemistry laboratory there. The building, which is now well under way, will have four floors devoted respectively (working upwards) to physical, inorganic, analytical, and organic chemistry. A feature of the laboratory is the automatic still and storage tank for distilled water on the roof; distilled water will be delivered by gravity to the floors below.

CLASSIFIED SECTION

NOTE : Trade announcements, other than strictly second-hand and job lines, cannot be inserted in these pages except by firms whose advertisements run in the display columns

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JUNIOR CHEMIST (male or female) required for analytical work, mainly non-ferrous metals. Degree not required, but applicants must have had previous experience. Write, stating age, experience, qualifications (if any), salary, etc., to Box No. 586, A. K. Advertising, 4 Talbot Mansions, Museum Street, W.C.1.

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HORIZONTAL Jacketed Drum MIXER, 4 ft. 6 in. dia. × 5 ft. 6 in. long, fitted with horizontal shaft arranged with agitating blades, driven through fast and loose pulleys. Mixer constructed throughout in mild steel.

Vertical Mild Steel MIXER, 5 ft. 6 in. internal diameter × 8 ft. 0 in. long, with conical bottom 2 ft. 9 in. deep, fitted with vertical stirring gear, driven through machine-cut crown wheel and pinion from fast and loose pulleys. THREE AVAILABLE.

Vertical Open Top Mild Steel MIXER, 4 ft. 9 in. dia. × 3 ft. 9 in. deep, welded construction throughout, 5/16 in. plate, 2 in. bottom run-off, fitted with vertical agitator shaft, driven through bevel and spur gearing from fast and loose pulleys. SEVEN AVAILABLE.

Johnson Fully Washing FILTER PRESS, with 59 chambers, 46 in. square, plate and frame type, ratchet closing gear, overall size 26 ft. 0 in. long, 10 ft. 6 in. wide, 6 ft. 6 in. deep.

No. 1 size KEK GRINDING MILL, with 26 in. dia. manganese steel pin grinding disc, fast and loose pulley drive.

Horizontal Steam Jacketed Rotating Hexagonal MIXER or BLENDER, 5 ft. 0 in. dia. × 3 ft. 6 in. wide, machine-cut gears, fast and loose pulleys.

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50	100	Ditto	Belt
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